



Plan

Internal Use Only	
Document Number: NK38-PLAN-09701-10067	Usage Classification: N/A
Sheet Number: 0016	Revision: R000

Title:

NUCLEAR REFURBISHMENT PROGRAM HEALTH AND SAFETY MANAGEMENT PLAN

© Ontario Power Generation Inc., 2013. This document has been produced and distributed for Ontario Power Generation Inc. purposes only. No part of this document may be reproduced, published, converted, or stored in any data retrieval system, or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise) without the prior written permission of Ontario Power Generation Inc.

**Nuclear Refurbishment Program Health
And Safety Management Plan**

NK38-PLAN-09701-10067-0016-R000
2013-01-31

Order Number: N/A
Other Reference Number: N/A

Internal Use Only

Prepared by: Paul Hurley
Manager Safety Strategy
Nuclear Refurbishment

Reviewed by: Frank Guglielmi
Director Operations and
Maintenance
Nuclear Refurbishment

Approved by: Craig Axler
Director Conventional Safety
Safety & Wellness

Plan

Internal Use Only		
Document Number:	Usage Classification:	
NK38-PLAN-09701-10067	N/A	
Sheet Number:	Revision Number:	Page:
0016	R000	2 of 16

Title:

NUCLEAR REFURBISHMENT PROGRAM HEALTH AND SAFETY MANAGEMENT PLAN

Table of Contents

	Page
Revision Summary	3
1.0 INTRODUCTION	4
2.0 PURPOSE.....	4
3.0 PROGRAM HEALTH AND SAFETY MANAGEMENT APPROACH	4
3.1 Health & Safety Value, Goals and Objectives	5
3.2 H&S Management Framework and Processes	5
3.2.1 H&S Management Framework.....	5
3.2.2 Health and Safety Management Processes	6
3.2.3 Health and Safety Management Documents for Program	8
3.3 ROLES AND RESPONSIBILITIES	9
3.4 Contractor H&S Management Expectations.....	9
3.5 Program Plan and Key Deliverables	10
3.6 Nuclear Refurbishment H&S Organization.....	10
4.0 HEALTH & SAFETY MANAGEMENT PLAN APPROVAL AND REVISIONS.....	10
Appendix A: Safety Organization for DN Refurbishment.....	11
Appendix B: Nuclear Refurbishment Safety Metrics & Safety Performance Targets	12
Appendix C: Nuclear Refurbishment O&M H&S P6 (Primavera) Plan.....	14
Appendix D: NR Conventional Safety Support Function and Services	15

Plan

Internal Use Only		
Document Number: NK38-PLAN-09701-10067		Usage Classification: N/A
Sheet Number: 0016	Revision Number: R000	Page: 3 of 16
Title: NUCLEAR REFURBISHMENT PROGRAM HEALTH AND SAFETY MANAGEMENT PLAN		

Revision Summary

Revision Number	Date	Comments
R000	2013-01-31	Initial issue.

Plan

Internal Use Only		
Document Number: NK38-PLAN-09701-10067		Usage Classification: N/A
Sheet Number: 0016	Revision Number: R000	Page: 4 of 16

Title:

NUCLEAR REFURBISHMENT PROGRAM HEALTH AND SAFETY MANAGEMENT PLAN

1.0 INTRODUCTION

Darlington Nuclear Generating Station (DNBS) is approaching its predicted end of service life and requires a major refurbishment in order to extend the service life. The refurbishment is currently planned to begin in 2016. The units will be shut down in a partially overlapping sequence with the second unit shutdown commencing after removal of all components in the first shutdown unit (i.e., the end of the removal phase of the first unit). For a complete description of the project, refer to D-PCH-09701-10000, Darlington Refurbishment Project Charter.

Due to the unique requirements associated with the Darlington Refurbishment mega-construction project, the large scope and duration of the project and the multi-employer (EPC/ES MSA contractors) configuration for the project where OPG is the *Constructor*, it is recognized that a unique approach to the management of operations and construction safety integrity is required so that all refurbishment work is completed in a safe, high quality, and economic manner.

This will require an integrated, aligned approach between Ontario Power Generation (OPG) and all Nuclear Refurbishment Contractors (EPC, ES MSA) where **Safety is the CORE VALUE** of the Nuclear Refurbishment (NR) Program as well as for each individual refurbishment project (i.e. Retube and Feeder Replacement, Islanding, Fuel Handling, Turbine and Generators, Balance of Plant, Shutdown & Layup).

2.0 PURPOSE

The Nuclear Refurbishment Program Health & Safety Management Plan (HSMP) describes how Nuclear Refurbishment and Contractors will manage the health and safety of all workers associated with the Nuclear Refurbishment Program.

It establishes a framework for the management of worker health and safety by Nuclear Refurbishment Projects, Department s and Vendors/Contractors in accordance to defined health and safety values, goals, objectives and expectations for the Nuclear Refurbishment Program.

3.0 PROGRAM HEALTH AND SAFETY MANAGEMENT APPROACH

There will be an over-arching Nuclear Refurbishment Safety Management Plan for the entire refurbishment project (NK38-PLAN-09701-10067 Sheet 16). This plan will provide NR and other business unit support staff with clear understanding of the H&S management requirements for the entire Nuclear Refurbishment Program including:

- Health and Safety Value, Goals and Objectives
- Health and Safety Management Framework and Processes
- Roles and Responsibilities

Plan

Internal Use Only		
Document Number:	Usage Classification:	
NK38-PLAN-09701-10067	N/A	
Sheet Number:	Revision Number:	Page:
0016	R000	5 of 16

Title:

NUCLEAR REFURBISHMENT PROGRAM HEALTH AND SAFETY MANAGEMENT PLAN

- Contractor H&S Management Expectations
- Program Plan and Key Deliverables
- Overview of Nuclear Refurbishment H&S Organization Structure, Services and Support

3.1 Health & Safety Value, Goals and Objectives

Together, OPG and all EPC/ES MSA Contractors on the project are committed to **Safety is our CORE VALUE** for the Nuclear Refurbishment Program.

With this commitment, OPG and Contractors will protect every employee's right to work in a safe and healthy refurbishment work environment. This will be achieved by preventing work-caused injury and ill health and by complying with all relevant safety legislation, written safety procedures and using safe work practices established for NR work.

Proof of this common commitment is translated by the following results:

- No NR project/construction related injury, illness or damage to property or the environment is acceptable.
- Will work collaboratively to prevent all such injury, illness or damage.
- Will accept nothing short of zero incidents as the only justifiable goal for Nuclear Refurbishment work.
- Will carry out refurbishment activities in a responsible manner that minimizes risks to employees, and the public.

3.2 H&S Management Framework and Processes

3.2.1 H&S Management Framework

To define and articulate this joint commitment and responsibility for health and safety within the project, all parties require a common *framework* that provides everyone with the "picture" of what effective H&S management looks like before refurbishment work even begins.

The *framework* provides Nuclear Refurbishment (including each project) with one common core value for safety, one common safety policy, one set of common safety rules, a single set of integrated , specific safety principles, objectives, responsibilities, expectations, performance measures, evaluations and verifications for the management of H&S by OPG and its Contractors.

Plan

Internal Use Only		
Document Number: NK38-PLAN-09701-10067		Usage Classification: N/A
Sheet Number: 0016	Revision Number: R000	Page: 6 of 16

Title:

NUCLEAR REFURBISHMENT PROGRAM HEALTH AND SAFETY MANAGEMENT PLAN

Nuclear Refurbishment has specified the *framework* for Nuclear Refurbishment Health and Safety in standard contract Safety Exhibit clause and ES MSA worksheets that includes reference to N-GUID-09701-10011: Safety Management Essentials for DN Refurbishment. The N-GUID is intended to serve as OPGs H&S performance specification for all Contractors with the purpose of providing the bases for the refurbishment's health & safety requirements that the Contractor Safety Program, Project Specific Safety Plans, safe work practices and safe work process procedures required to demonstrate equivalency to OPG H&S processes and procedures.

The guide shall apply to OPG and EPC/ES MSA Contractors and will be integrated into their Health & Safety Programs and Project Specific Safety Plans. The EPC/ES MSA Contractors shall develop a project specific H&S Program/Manual for their project that meets or exceeds the requirements of N-GUID-09701-10011. The EPC/ES MSA Program shall include specific EPC Contractor developed safety plans associated with managing safety risk for every major project phase and associated work tasks.

In addition the *framework* provides OPG's expectations for project H&S oversight and evaluation of the quality of the Contractor's H&S program, Project Specific Safety Plans and safe work practices and processes that will be an integral part of the Project Oversight Plans for each project. Contractors are expected to apply the N-GUID as part of their H&S oversight program and plans.

Together, the Contract (including N-GUID-09701-10011), the Project Safety Management Plan and the EPC/ES MSA Contractor's Safety Program, Project Specific Safety Plans, Safe Work Practices & Processes forms the bases of the Health and Safety Management *framework* for the Nuclear Refurbishment Program.

3.2.2 Health and Safety Management Processes

The processes within OPG that Health and Safety Management will be established for the Nuclear Refurbishment Program include:

Contracting Requirements for H&S Management

- Standard Project contract clauses (Safety Exhibit) and supporting documents (addendums) identifying OPGs expectations for H&S management by Contractors. Current H&S policy and program standards will apply to all contractors to ensure the same level of H&S "quality" is maintained throughout the refurbishment.

Plan

Internal Use Only		
Document Number: NK38-PLAN-09701-10067		Usage Classification: N/A
Sheet Number: 0016	Revision Number: R000	Page: 7 of 16

Title:

NUCLEAR REFURBISHMENT PROGRAM HEALTH AND SAFETY MANAGEMENT PLAN

- Performance based H&S specification (N-GUID-09701-10011: Nuclear Refurbishment Safety Management Essentials) as a contract addendum that will identify the H&S management requirements and safety outcomes that must be satisfied by the contractors on the project. For example, the performance-based specification will be the basis document for the contractors' H&S programs, (e.g. regulatory basis and standards to which the project will subscribe (CSA, CAN/ULC, etc.), and will outline training basis, safety performance reporting standards, incident/ accident investigation, hazard specific performance specifications, prescribed OPG governance, and Industry OPEX Focus Areas (e.g. Falling Objects)
- Contractors (employers as defined by OH&SA) are pre-qualified using stringent Health and Safety criteria. These criteria will demonstrate the contractor's commitment to safety and their senior management's commitment to safety.
- Contractor H&S submissions are reviewed as part of the bidding process and constructive feedback on areas for improvement is provided.
- Post Bid/Award of Contract to include the requirement for contractors to develop and implement integrated plan(s) to "incorporate" OPG NR Safety Management Essentials and Project Safety Management Plans into their H&S Program and Project Specific Safety Plans.

Program & Project/Departmental H&S Risks

Program and Project H&S risk information is input into the Refurbishment Program Risk Register (RADAR) database and the Refurbishment Project/Departmental Risk Register (RADAR).

H&S Performance Metrics and Targets

A single, consistent set of H&S Metrics (measures and targets) for Nuclear Refurbishment and Contractors at the Program and Project levels have been approved for use and are included in N-GUID-09701-10011. See Appendix C.

NR Senior Line Management, NR Project Teams and Contractors will use the metrics to identify unsatisfactory performance against prescribed targets and identify methods to eliminate causes for unsatisfactory safety performance.

Program and Project H&S metrics will be tracked on a prescribed frequency and reported graphically, or otherwise, through the Refurbishment Program Monthly Status Report and Project Manager Status Reports.

NR Design Packages and Field Procedures

H&S requirements will be defined in Nuclear refurbishment design packages and field procedures.

Plan

Internal Use Only		
Document Number:	Usage Classification:	
NK38-PLAN-09701-10067	N/A	
Sheet Number:	Revision Number:	Page:
0016	R000	8 of 16

Title:

NUCLEAR REFURBISHMENT PROGRAM HEALTH AND SAFETY MANAGEMENT PLAN

H&S Communications

As part of the NR O&M H&S P6 Plan, an activity is allocated to implement a joint OPG & Contractor H&S Communications Plan, where both OPG NR and Contractors will continually communicate a single, consistent message to all staff that “Safety is the **CORE** Value of the Darlington Refurbishment Project” (“Safety” includes Nuclear, Conventional, Radiological and Environmental safety) will be established.

H&S Training

Health and Safety training for Nuclear Refurbishment and Contractors is defined NK38-PLAN-09701-10007 and N-TQD-510-00001.

H&S Oversight and Monitoring

H&S oversight and monitoring requirements for Nuclear Projects will be established under direction of N-STD-AS-0030: Project Oversight Standard. H&S oversight criteria are identified in N-GUID-09701-10011: Safety Management Essentials for DN Refurbishment. H&S oversight criteria will be included in Project Oversight Plans (POPs).

A DN Refurbishment JHSC and Worker Trades Committee will be established and will be a key H&S compliance oversight group for the Program.

H&S Information Management

Formal H&S Management documentation shall follow the OPG Nuclear Records and Documents Control process, N-PROG-AS-0006.

3.2.3 Health and Safety Management Documents for Program

- Health and Safety Management System Program OPG-PROG-0010
- DN Refurbishment Safety Management Essentials N-GUID-09701-10011
- DN Refurbishment Health and Safety Metrics NK38-REP-09701-10127
- Project Oversight Standard N-STD-AS-0030
- Risk Project Management Standard N-PROC-LE-0028
- Information Management N-PROG-AS-0006
- Contractor and General Employee Training NK38-PLAN-09701-10007

Plan

Internal Use Only		
Document Number:	Usage Classification:	
NK38-PLAN-09701-10067	N/A	
Sheet Number:	Revision Number:	Page:
0016	R000	9 of 16

Title:

NUCLEAR REFURBISHMENT PROGRAM HEALTH AND SAFETY MANAGEMENT PLAN

3.3 ROLES AND RESPONSIBILITIES

For the Nuclear Refurbishment Program, Health and safety is a shared responsibility.

All OPG and Contractor employees:

- Have accountability for Health and Safety. This includes making conservative decisions regarding refurbishment operation and construction activities as they relate to the health and safety of our employees and the public.
- Are accountable for performing work safely and for identifying, communicating and, where appropriate, correcting workplace hazards in order to protect themselves, their co-workers, other Contractors or the public from harm.

OPG Nuclear Refurbishment is accountable for:

The role and responsibility as the *Owner/Constructor*.

All OPG and Contractor line management are accountable for:

- The health and safety of their employees at OPG workplaces and for ensuring their activities do not harm any employees or the public.
- Ensuring the work environment is designed to protect workers and the public;
- Ensuring that work is planned and performed to protect workers and the public;
- Providing employees with the information, training, tools, procedures and support required to do their job safely and without harming other workers or the public.

For detailed OPG Nuclear Refurbishment and Contractor HS& roles and responsibilities (including potential MoL citability for various roles) refer to N-GUID-09701-10011.

3.4 Contractor H&S Management Expectations

All contractors and sub-contractors are expected to be aligned and demonstrate visible commitment to Nuclear Refurbishment's core value for safety and to manage health and safety in accordance with the terms and conditions of their contract(s), their H&S Programs, Project Specific Safety Plans, safe work practices and processes. They are also expected to monitor and oversee their H&S programs and plans and willingly participate with OPG to improve practices and processes, implement corrective actions and lessons learned to improve their H&S management system.

Plan

Internal Use Only		
Document Number:	Usage Classification:	
NK38-PLAN-09701-10067	N/A	
Sheet Number:	Revision Number:	Page:
0016	R000	10 of 16

Title:

NUCLEAR REFURBISHMENT PROGRAM HEALTH AND SAFETY MANAGEMENT PLAN

Each individual project (e.g. RFR, F/H, Islanding, Turbine and Generator, Balance of Plant, Shutdown & Layup etc.) will have its own specific Safety Management Plan which will contain the unique requirements for management of H&S risks associated with specific project activities. These plans will provide NR Project Teams and support staff with a clear understanding of the H&S management requirements for the project(s).

3.5 Program Plan and Key Deliverables

Key dates and deliverables to support the completion of the Program Health and Safety Management Plan are identified in the NR O&M H&S P6 Plan (73018) and include activities that the Program Manager and others will perform to support the plan. The NR O&M H&S P6 Plan is a live plan and is updated on a monthly basis. See (Appendix C: NR O&M H&S P6 Plan - 73018).

3.6 Nuclear Refurbishment H&S Organization

The NR Health and Safety organizational structure for the Nuclear Refurbishment Project will be a Centre of Excellence organization reporting to the Nuclear Refurbishment Director of Operations and Maintenance.

The organization provides H&S support and services to the NR management team, the NR Refurbishment Execution organization and the NR Functional Departments.

A description of the organizational structure in support of NR H&S management is provided in Appendix A.

A description of the NR Conventional Safety services and support provide to the program is provided in Appendix D.

4.0 HEALTH & SAFETY MANAGEMENT PLAN APPROVAL AND REVISIONS

The Nuclear Refurbishment H&S Management system is subject to regular review to ensure compliance with the requirements of NR oversight governance. The health and safety management process is designed to manage, rather than eliminate, the risk of failure to achieve project objectives and this plan will form part of the ongoing process in place for identifying, assessing, managing, monitoring and reporting on the health and safety risks.

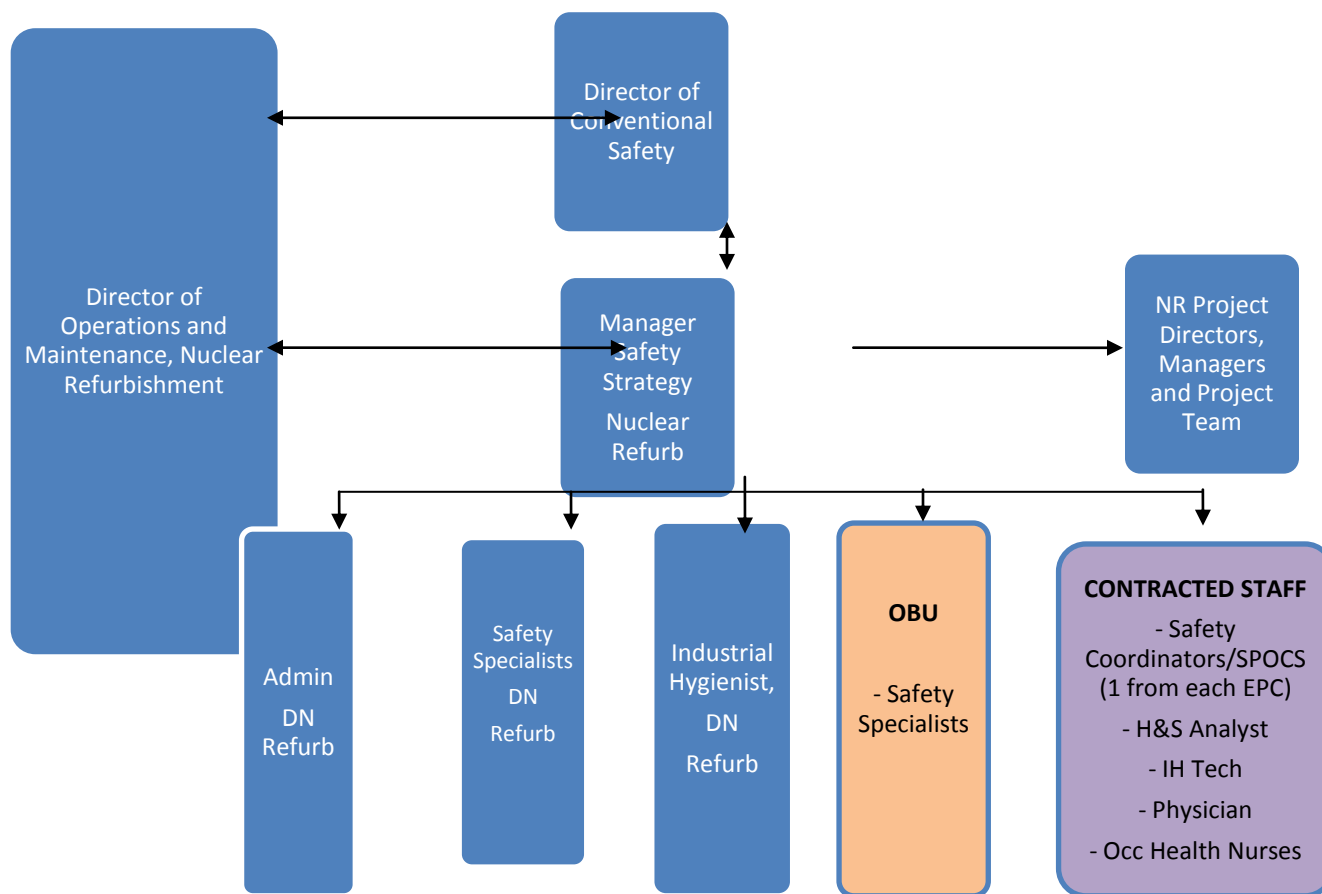
The Nuclear Refurbishment H&S Management Plan is a live document, to be maintained by the Program Manager, or delegate and is to be considered as a reporting tool to senior management

Plan

Internal Use Only		
Document Number: NK38-PLAN-09701-10067		Usage Classification: N/A
Sheet Number: 0016	Revision Number: R000	Page: 11 of 16

Title: NUCLEAR REFURBISHMENT PROGRAM HEALTH AND SAFETY MANAGEMENT PLAN
--

Appendix A: Safety Organization for DN Refurbishment



Plan

Internal Use Only		
Document Number: NK38-PLAN-09701-10067		Usage Classification: N/A
Sheet Number: 0016	Revision Number: R000	Page: 12 of 16

Title: NUCLEAR REFURBISHMENT PROGRAM HEALTH AND SAFETY MANAGEMENT PLAN
--

Appendix B: Nuclear Refurbishment Safety Metrics & Safety Performance Targets

In order to ensure OPG and Contractors meeting the performance targets and expectations for DN Refurbishment, the following table shows safety measurement reporting used on the project.

SAFETY MEASURES
LEADING (a) Percent improvement, measured over defined period of time, for low rated scores of industrial safety questions asked in a validated perception survey administered throughout each level of the organization. (b) Percent or ratio of Safety Incident Corrective Actions from apparent and root cause investigations completed or closed out in time. (c) Actual amount of time taken vs. a target time to fix safety flagged/priority hazardous conditions and deficiencies (d) Number/ratio/percentage of peer to peer observations and coaching against established safety behaviour standard(s) & target(s)
LAGGING (a) All Injury Rate (AIR) (b) Accident Severity Rate (ASR) (c) Lost Time Injury Frequency (d) Recordable Incident Frequency Rate (e) Days Away Restricted Duties or Transfer (DART)

Plan

Internal Use Only		
Document Number: NK38-PLAN-09701-10067		Usage Classification: N/A
Sheet Number: 0016	Revision Number: R000	Page: 13 of 16

Title:

NUCLEAR REFURBISHMENT PROGRAM HEALTH AND SAFETY MANAGEMENT PLAN

SAFETY MEASURES

NOTIFICATIONS

- (a) Reportable Injury – CEA/WSIB
- (b) Reportable Injury – MOL (OHSA S. 51, 52 and 53)
- (c) Lost Time Incident
- (d) Lost Time (Days)
- (e) Near Miss Incident having reasonable potential for harm
- (f) First Aid Incident
- (g) Reportable Incidents - Reg 213/91 Section 53
- (h) Construction Occurrences - Reg 213 Section 11
- (i) MOL Orders - Timed Compliance
- (j) MOL Orders - Stop Work

All Injury Rate: # lost time injuries + medical treatment injuries per 200,000 hours

Lost Time Injury Frequency: # of lost time injuries per 200,000 hours.

Accident Severity Rate: # days lost per 200,000 hours

Serious Near Miss: Any exposure or event in which could have resulted in a fatality or total permanent disability. Section 53 O. Reg 213/91

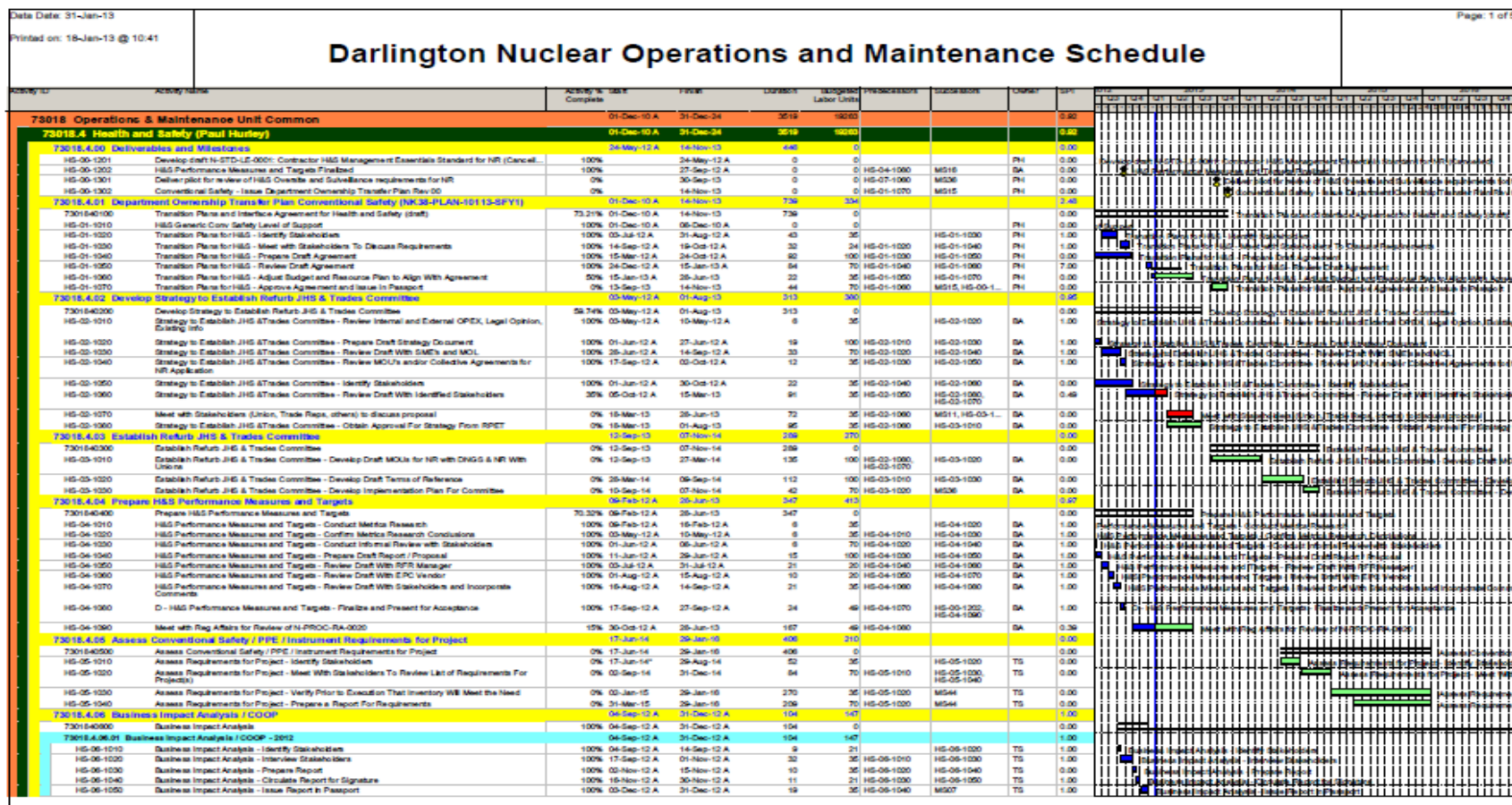
Recordable Incident Frequency: # of recordable incident x 200,000 hours / total # person hours

Plan

Internal Use Only			
Document Number: NK38-PLAN-09701-10067		Usage Classification: N/A	
Sheet Number: 0016	Revision Number: R000	Page: 14 of 16	

Title:
NUCLEAR REFURBISHMENT PROGRAM HEALTH AND SAFETY MANAGEMENT PLAN

Appendix C: Nuclear Refurbishment O&M H&S P6 (Primavera) Plan



Plan

Internal Use Only		
Document Number: NK38-PLAN-09701-10067		Usage Classification: N/A
Sheet Number: 0016	Revision Number: R000	Page: 15 of 16
Title: NUCLEAR REFURBISHMENT PROGRAM HEALTH AND SAFETY MANAGEMENT PLAN		

Appendix D: NR Conventional Safety Support Function and Services

The activities and responsibilities identified in this plan include support for planned H&S activities identified in NR Operations and Maintenance P6 H&S Plan (73018) including (but not limited to):

- Support to Nuclear Refurbishment Project Managers (e.g. development of H&S expectations for Vendors, H&S clause for contracts, support for development of Project Managers' Safety Management Plans, review of Vendor H&S Program, Project Specific Safety Plans and Safe Work Practices/Processes documents)
- Support to Nuclear Refurbishment Function Managers to develop and issue H&S specifications, provide input into H&S training requirements, produce oversight and surveillance criteria and other H&S standards for the DN Refurbishment project
- Support program and project risk management activities.
- Support to implementation and tracking/reporting of H&S metrics and JHSC for DN Refurbishment Program
- Produce and implement H&S oversight and surveillance processes, criteria and job aids for DN Refurbishment projects (e.g. Retube & Feeder Replacement, Turbine Generator, Shutdown and Layup, Islanding, Balance of Plant, Steam Generators, Fuel Handling)
- Conduct Oversight & Surveillance of Retube & Feeder Replacement H&S training delivery and practice at the DEC TMB and for Darlington Refurbishment Projects (e.g. Retube & Feeder Replacement, Turbine Generator, Shutdown and Layup, Islanding, Balance of Plant, Steam Generators, Fuel Handling)
- Support to Nuclear Refurbishment Execution organization, Project Managers and NR Regulatory Affairs with regulatory requirements and interfaces (Notice of Project, MoL investigations and visits, CNSC requests)
- Develop and implement the Refurbishment Industrial Hygiene Testing and Sampling Program for DN Refurbishment projects and Re-Start
- Assess PPE/Respiratory Protection/Safety/IH Instrument requirements for DN Refurbishment and confirm Vendor inventories
- Develop Safety Communications plans and schedule for Nuclear Refurbishment and Vendors
- Participate in delivery of NR Constructor Awareness Sessions and development of continuing training (CAL) for OPG staff
- Review and provide technical support for development of NR H&S training

Plan

Internal Use Only		
Document Number:	Usage Classification:	
NK38-PLAN-09701-10067	N/A	
Sheet Number:	Revision Number:	Page:
0016	R000	16 of 16

Title:

NUCLEAR REFURBISHMENT PROGRAM HEALTH AND SAFETY MANAGEMENT PLAN

- Hiring and training NR Conventional Safety personnel as required for supporting refurbishment readiness, execution and return to service phases of the program.
- Manage Safety & Wellness, DNGS/PNGS Conventional Safety and NR Conventional Safety staff personnel performance throughout the duration of the project